A Sustainable Hastings-Sunrise

Preet Heer

Erin Embley

Sustainability Planning for Hastings Sunrise

- Sustainability and Green Urban Design
- Why look at Sustainability - National and Regional Context, and Rational
- Current Policies and Regulations for the Hastings Strip in Hastings Sunrise
- Opportunities for more sustainable infill and future green development
- Examples of developments and renovations using sustainable practices within the Lower Mainland
- Battling the process, working within and around existing zoning and regulatory policies
- Suggestions for new green urban design in Hastings Sunrise

scenes on hastings

PART 4

Sustainability and Green Urban Design

Defining Sustainability

Global

"development that meets the needs of the
present without compromising the ability c
further generations to meet their own neec
Bruntland Commiss

Local

Sustainable development requires an integration of the ***ecological imperative*** to stay within the carrying capacity of the planet, the ***economic imperative*** to provide an adequate standard of living for all, and the ***social imperative*** to develop forms of governance that promote the values people want to live by.

Sustainable Development Research Institute, UBC

scenes on hastings

Defining Green Design

Green building design makes *incremental* improvements in the environmental performance of buildings beyond typical practice. By continually improving *individual* buildings, the collective reduction in resource use and ecological loading associated with the built environment will be considerable.

Why Look at Sustainability?

National and Regional Context, and Rational

Air Quality and Land Use

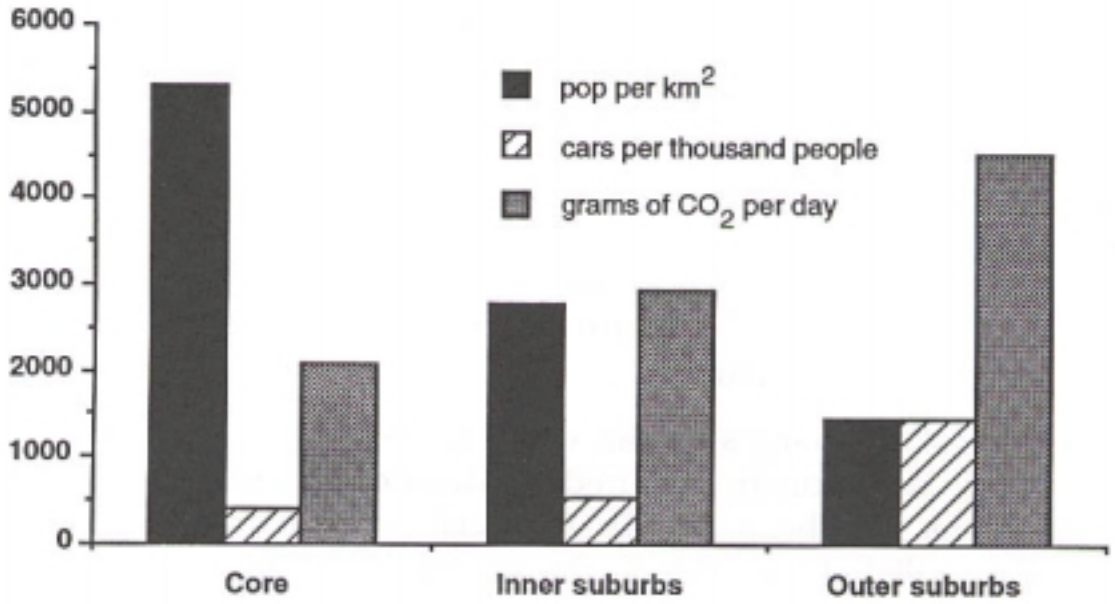
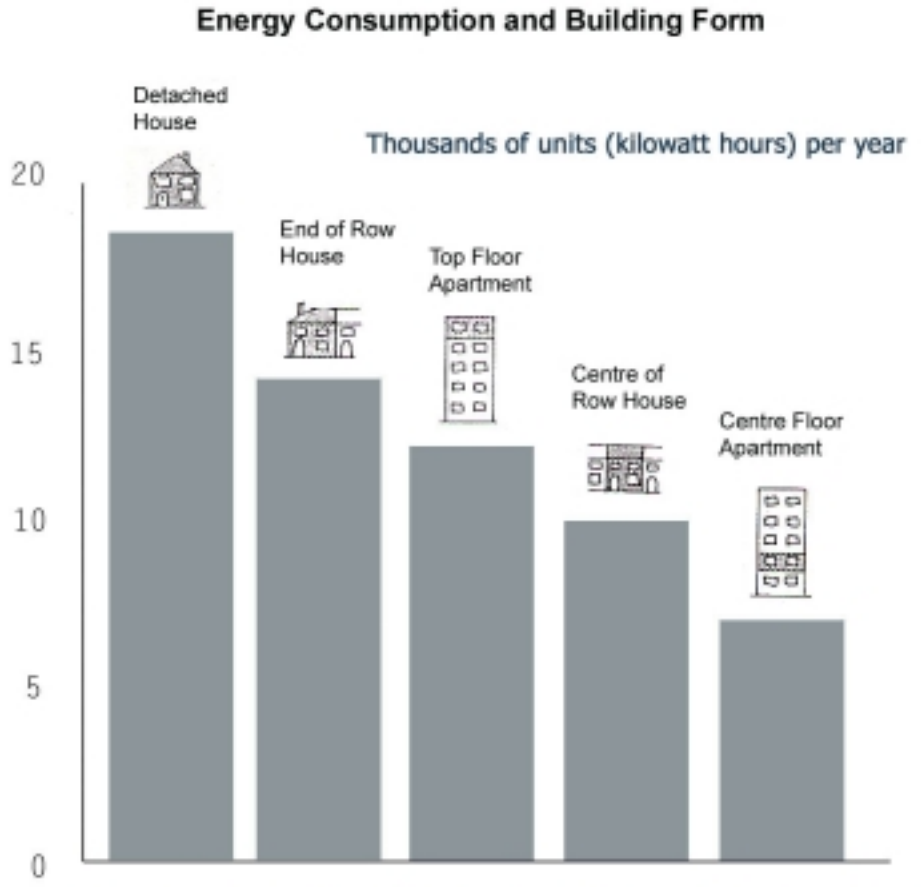


Figure 5.14 Toronto: Population, Car Ownership, Carbon Dioxide Impact.
Source: Gilbert 1991: 184

Energy Consumption



All the houses and apartments in the diagram are the same size and have the same proportion of window to outside wall

Source: G.L.C. Reproduced in Edwards 1991

Household Water Use

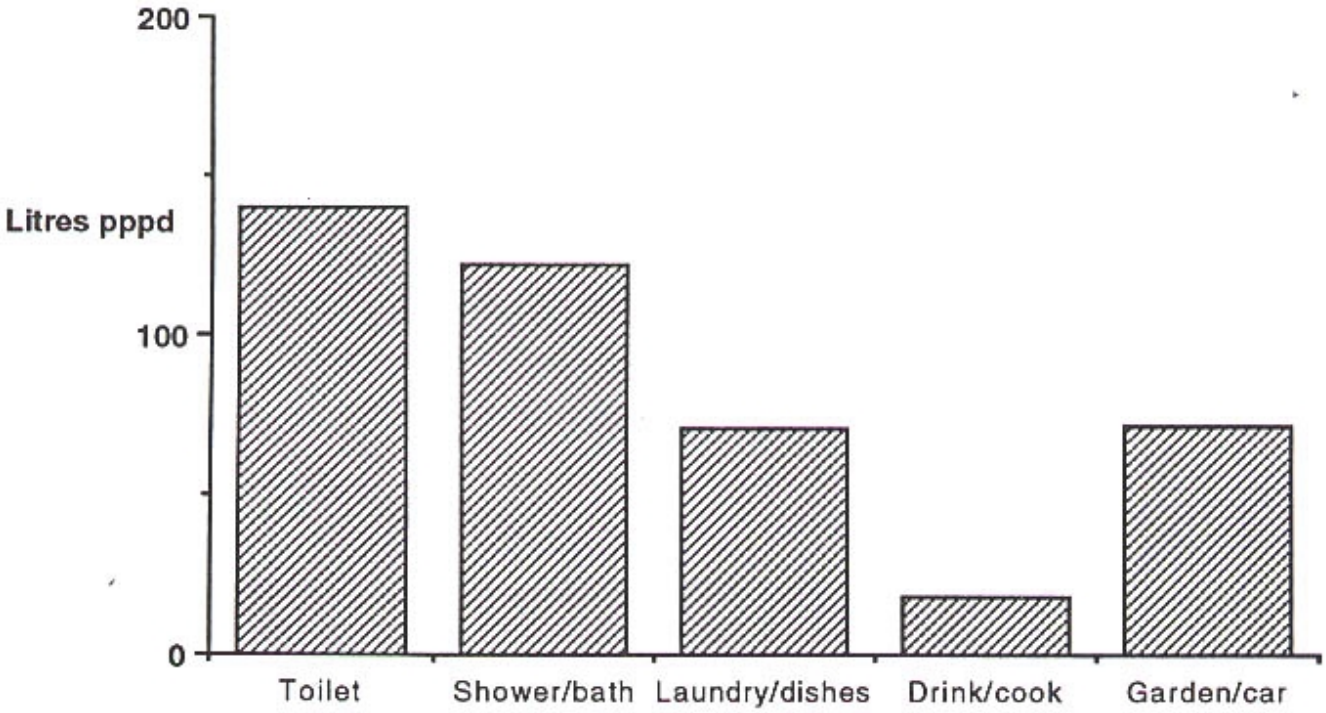
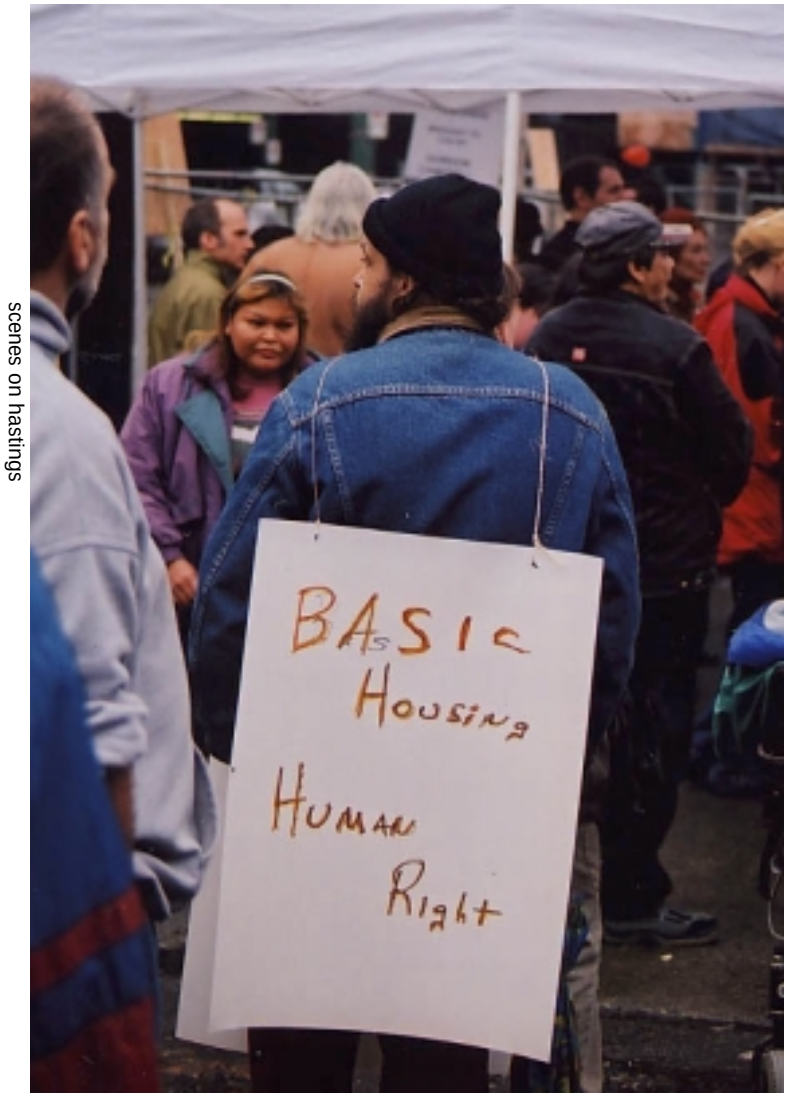


Figure 6.2 Personal Water Use in Canada. *Source*: Environment Canada 1990: 5



scenes on hastings

Housing Affordability

In Canada 4.5 million people are in 'core need'

Rents are rising in every one of Canada's 26 metro areas faster than inflation

Housing Policy

The federal government cut all new social housing in 1993, Provincial and federal governments cut 480.5 million from 1993 to 2000

Facts from National Housing & Homelessness Network

National

Regional

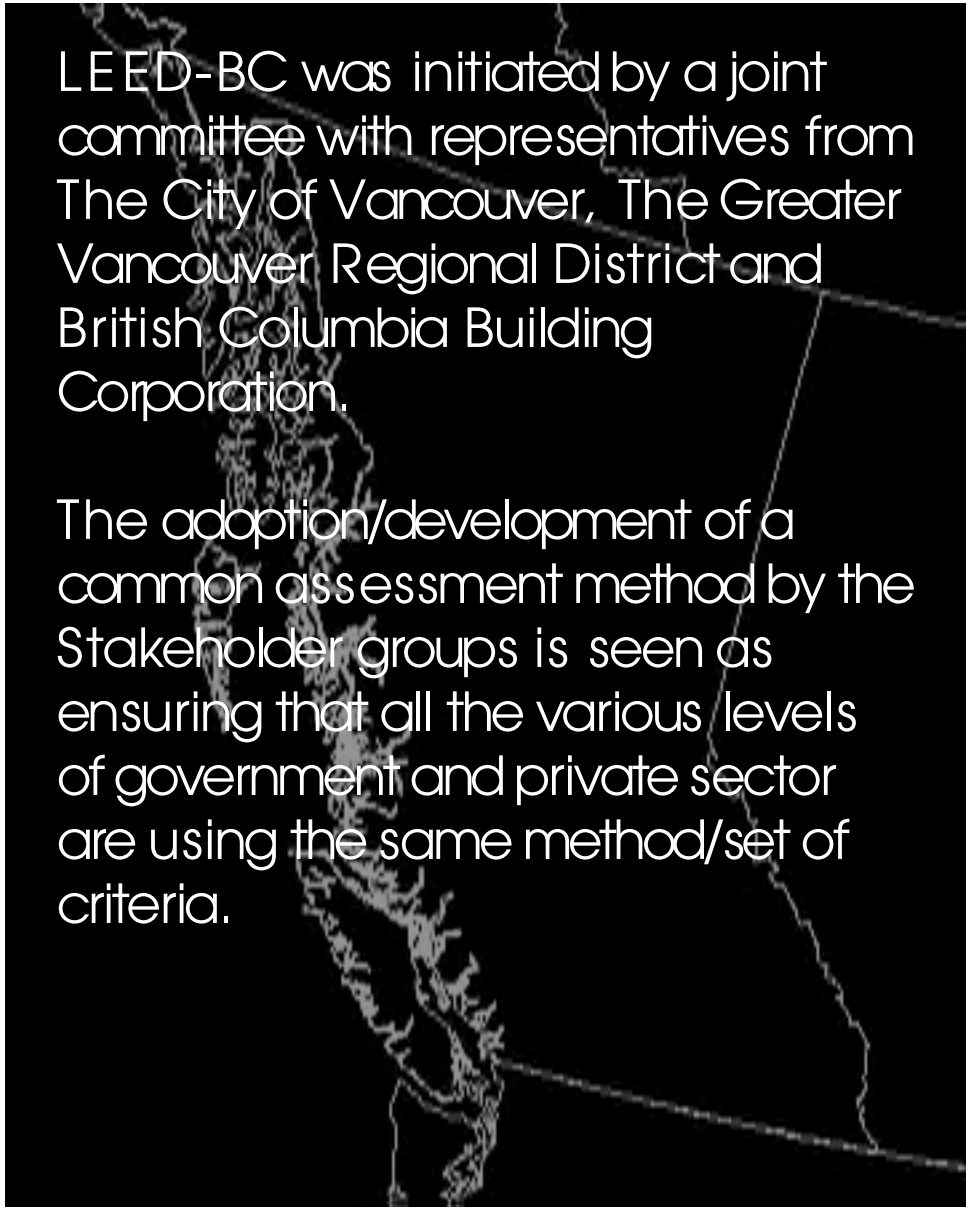
Local

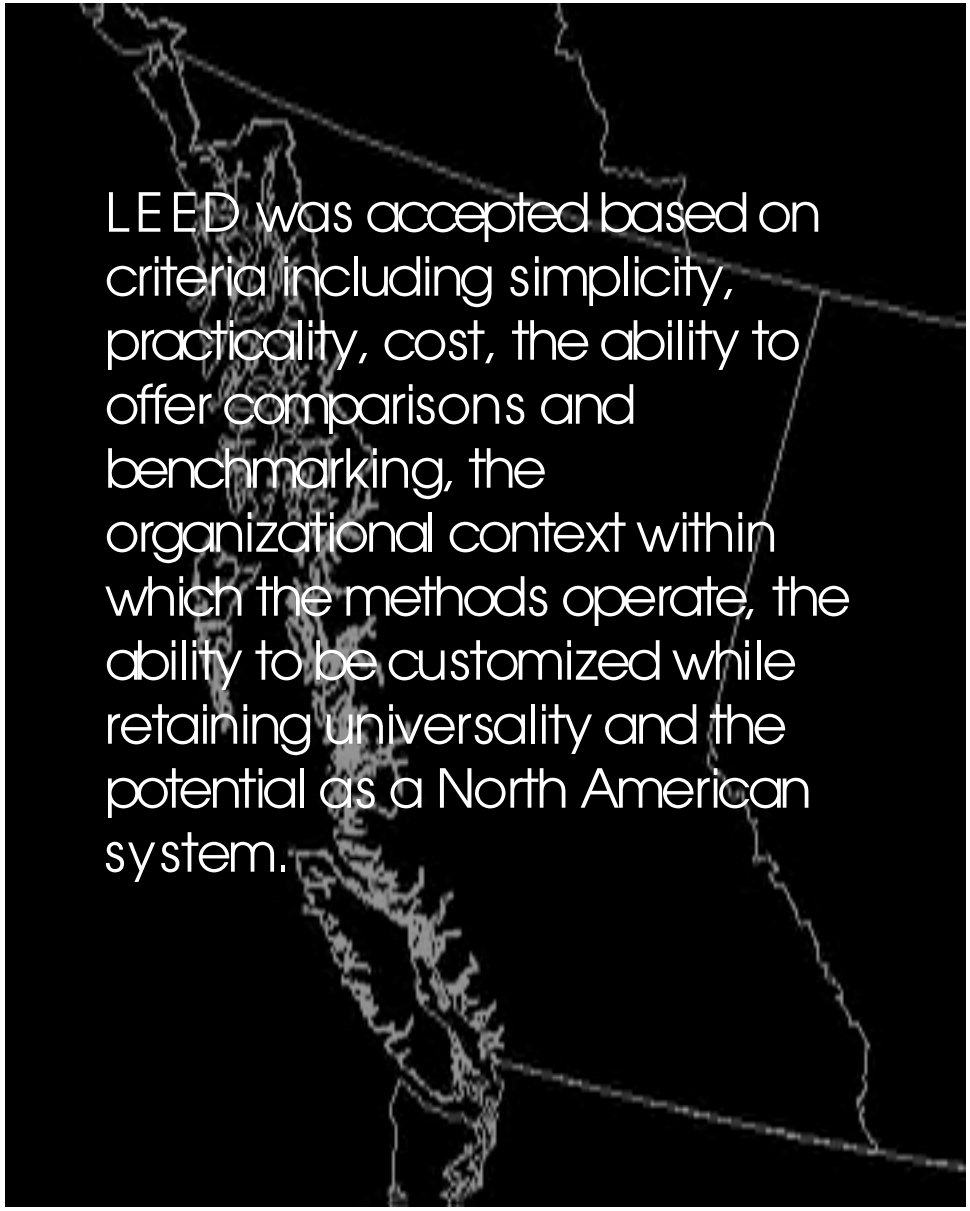
scenes on hastings


1987
• Canada and 138 other countries signed the Montreal Protocol on Ozone Depleting Substances, which established a timetable for the reduction and elimination of specific ozone depleting substances.


1992
•Canada and 150 other countries signed the Climate Change Convention, requiring developed countries to report on their actions with the aim of reducing emissions of greenhouse gases to 1990 levels by 2000 (currently ~13% higher)
• Canada signed the United Nations Convention on Biological Diversity, meant to guide the actions of governments and citizens to protect Canada's biodiversity and meet the commitments under the convention.

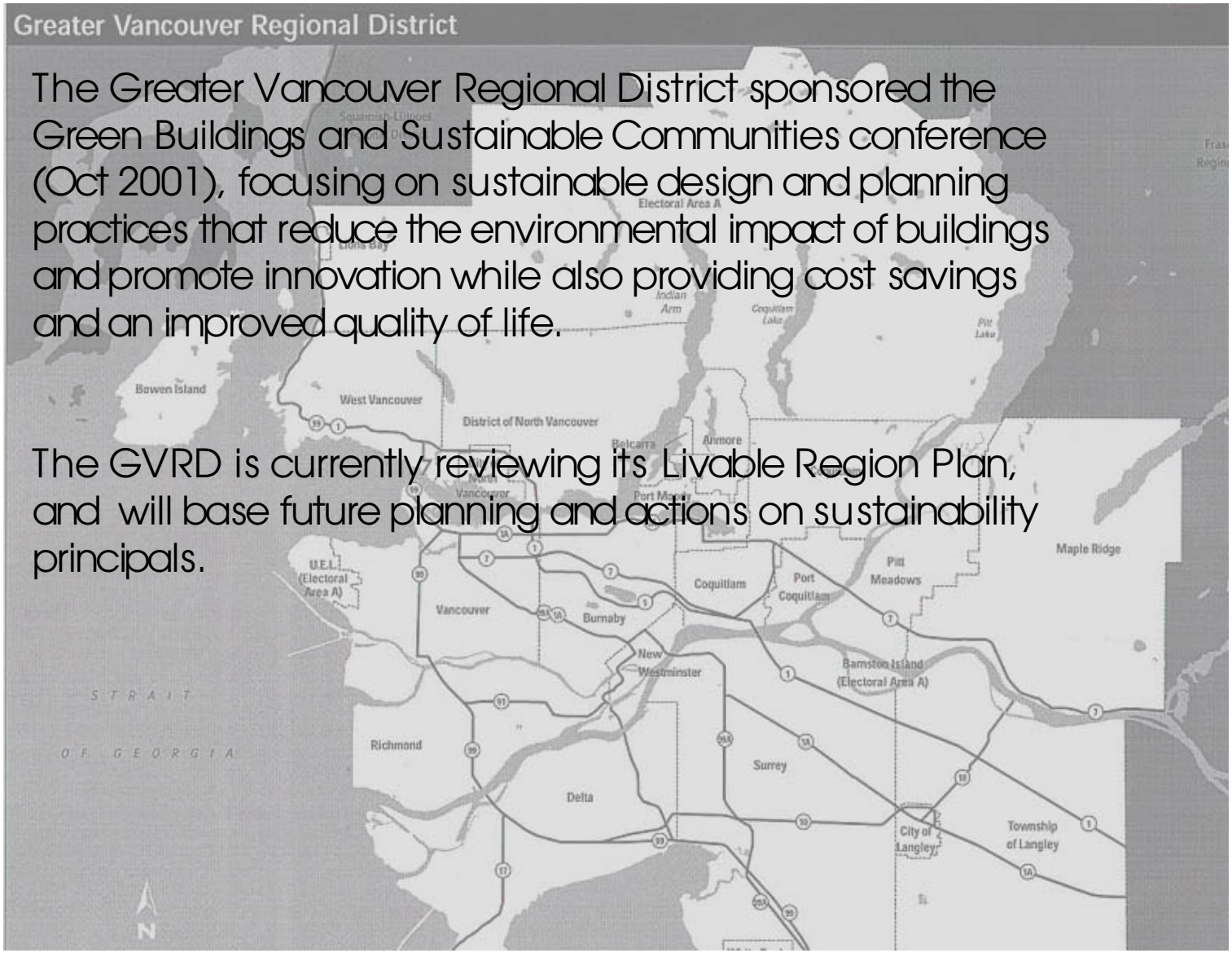

1997
•Canada and more than 160 other countries met in Kyoto, Japan, and agreed to targets to reduce GHG emissions. The agreement that set out those targets, and the options available to countries to achieve them, is known as the Kyoto Protocol.


LEED-BC was initiated by a joint committee with representatives from The City of Vancouver, The Greater Vancouver Regional District and British Columbia Building Corporation.
The adoption/development of a common assessment method by the Stakeholder groups is seen as ensuring that all the various levels of government and private sector are using the same method/set of criteria.


LEED was accepted based on criteria including simplicity, practicality, cost, the ability to offer comparisons and benchmarking, the organizational context within which the methods operate, the ability to be customized while retaining universality and the potential as a North American system.

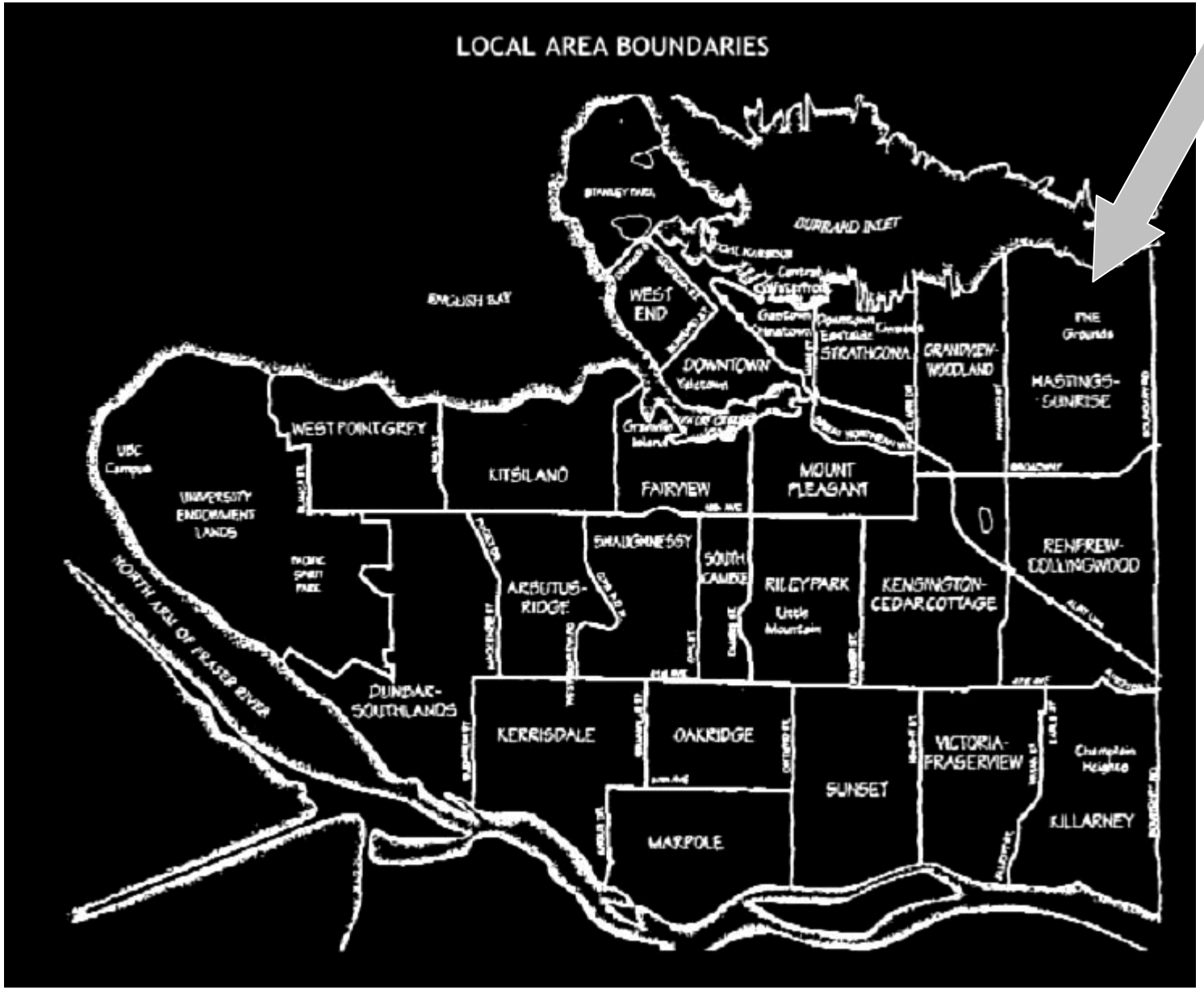
The credits are organized in the six principal LEED-2 categories:

- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environmental Quality
- Innovation and Design



The Greater Vancouver Regional District sponsored the Green Buildings and Sustainable Communities conference (Oct 2001), focusing on sustainable design and planning practices that reduce the environmental impact of buildings and promote innovation while also providing cost savings and an improved quality of life.

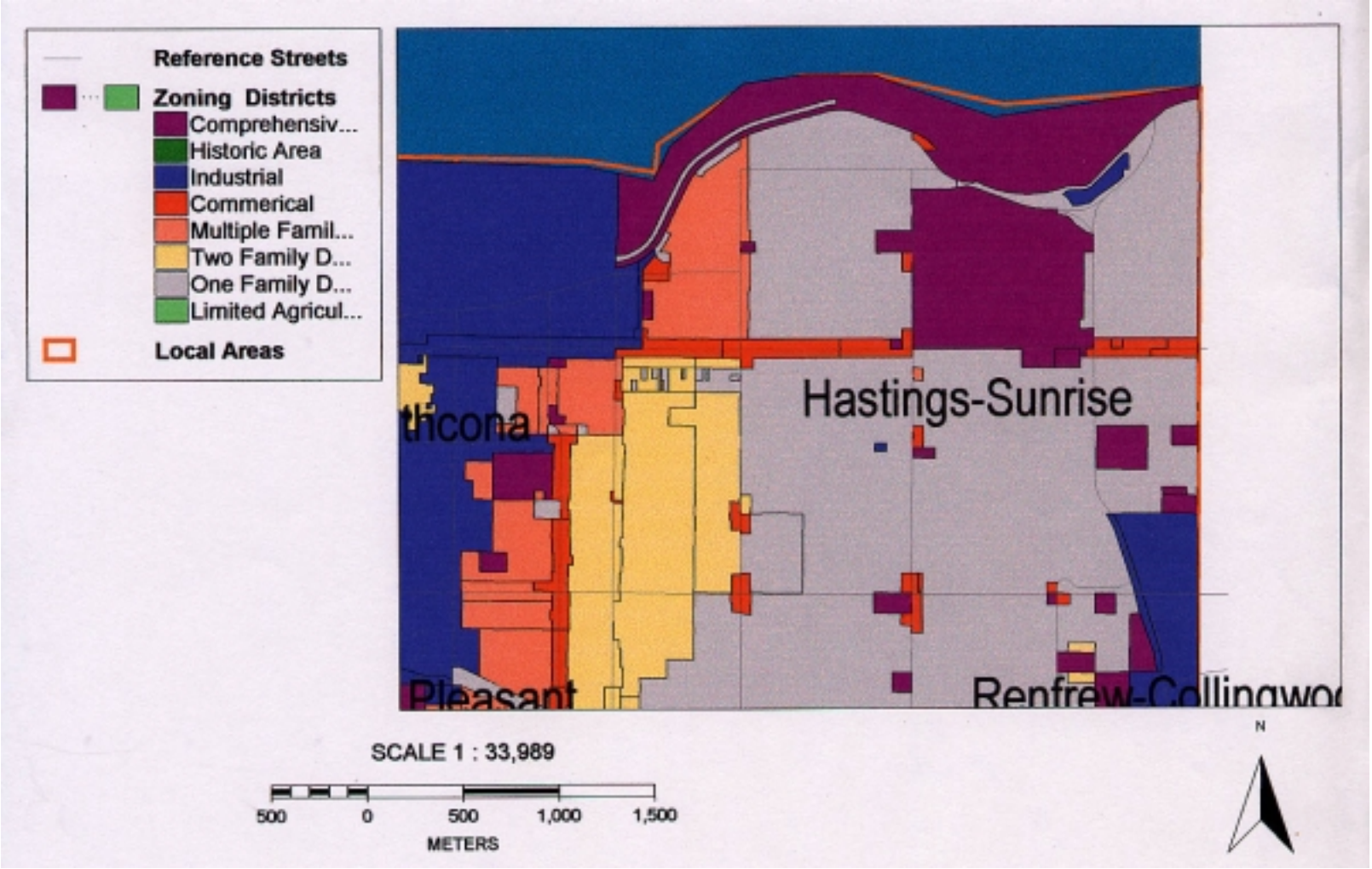
The GVRD is currently reviewing its Livable Region Plan, and will base future planning and actions on sustainability principals.


LOCAL AREA BOUNDARIES
BURRARD INLET
ENGLISH BAY
WEST END
DOWNTOWN
STRATHCONA
GRANDVIEW-WOODLAND
HASTINGS-SUNRISE
PNE Grounds
WEST POINT GREY
UBC Campus
UNIVERSITY ENDOWMENT LANDS
KITSILANO
FAIRVIEW
MOUNT PLEASANT
SHAUGHNESSY
SOUTH CAMBIE
ARBUTUS-RIDGE
RILEY PARK
Little Mountain
KENSINGTON-CEDAR COTTAGE
RENFREW-COLLINGWOOD
NORTH ARM OF FRASER RIVER
DUNBAR-SOUTHLANDS
KERRISDALE
OAKRIDGE
SUNSET
VICTORIA-FRASERVIEW
Champlain Heights
KILLARNEY
MARPOLE

PART 4

Current Policies and Regulations for the Hastings Strip in Hastings Sunrise

Existing Zoning



scenes on hastings

Hastings-Sunrise Planning Policy

- 1985 Neighborhood Plan
  Some infill and multiple family development

- City Goal to increase housing type/mix in all areas of the city

- Hasting-Sunrise planned for Community Visioning Process 2002

Hastings-Sunrise Study Area

Opportunities for more sustainable infill and future green development




Potential for infill development on vacant lots and parking lots fronting on Hastings Street

Provide options for achieving greater energy efficiency in existing and new structures

Assess current infrastructure for potential second/third story development on existing commercial buildings

Maintain neighborhood character and parking while improving efficiency and enabling greater density

Examples of developments and renovations using sustainable practices within the Lower Mainland

scenes on hastings





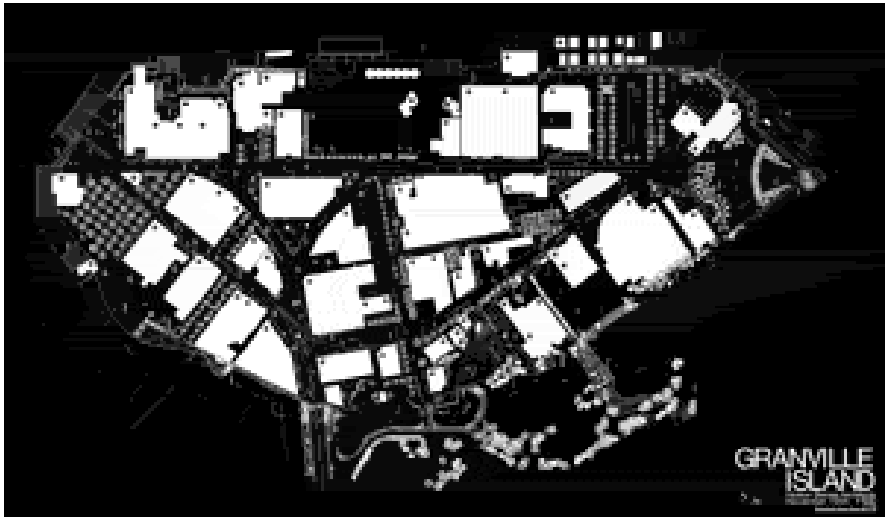
Residential Densification

Mole Hill Community

26 houses including the oldest in Vancouver are currently being renovated into 175 homes. The homes range from studio's to 3 bedroom units and most are slated for low-income housing.

The FSR on the site will be 1.0 upon completion

The site is also incorporating geothermal heating and retrofitting it into these heavily renovated buildings.



Mixing Uses

Granville Island

Began with 6 warehouses being converted into 4000m^2 of ground level market space and 800m^2 of 2nd level offices. It is now the most successful retail establishment of its kind in North America (grosses $1300/ft^2).

Recognized for its innovative integration of uses; industrial, retail, civic and residential and unique sharing of public and road space.

Alternative Stormwater Management

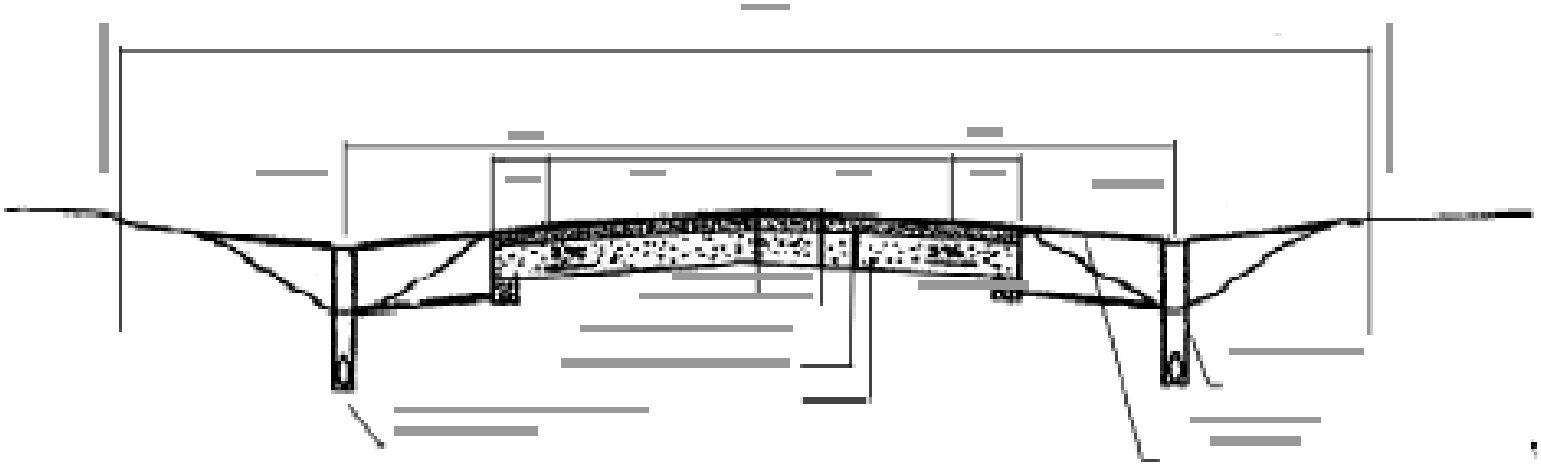
Retention areas double as community lawns and could provide opportunities for unique landscaping

Amble Green, Surrey

Grassy shoulder enabling infiltration capacity – rocks work to discourage driving or parking on shoulder

Brookswood, Langley

Swales, encourage more water absorption and natural movement and flow.



Community Gardens

Provides useable and aesthetic green space

Facilitates community cohesion

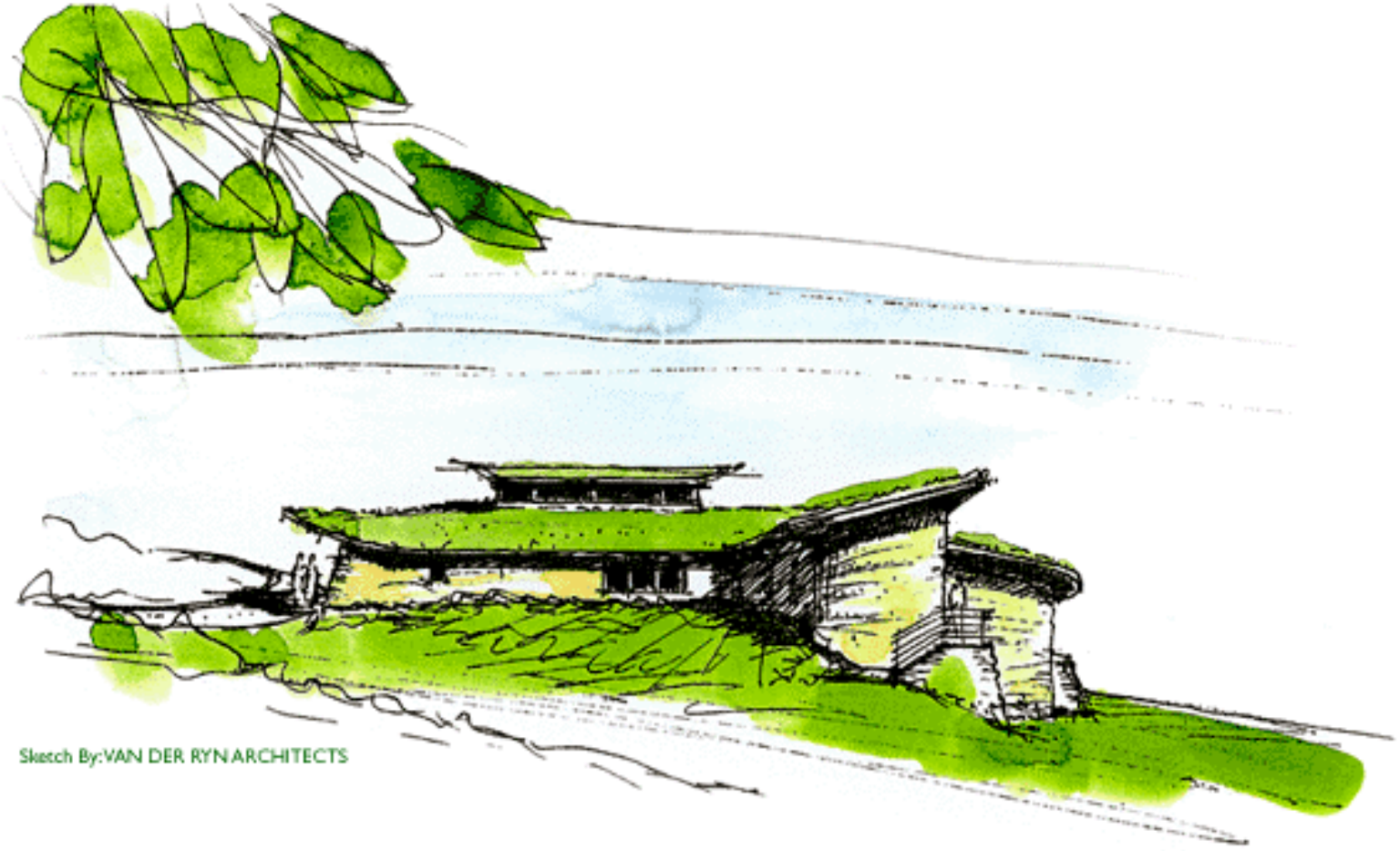
Allows capacity for food growth within neighborhoods

Rooftop Gardens

Using leftover roof and deck space to grow flowers and vegetables which help use and cycle rainwater on site.

Green Roof Technology

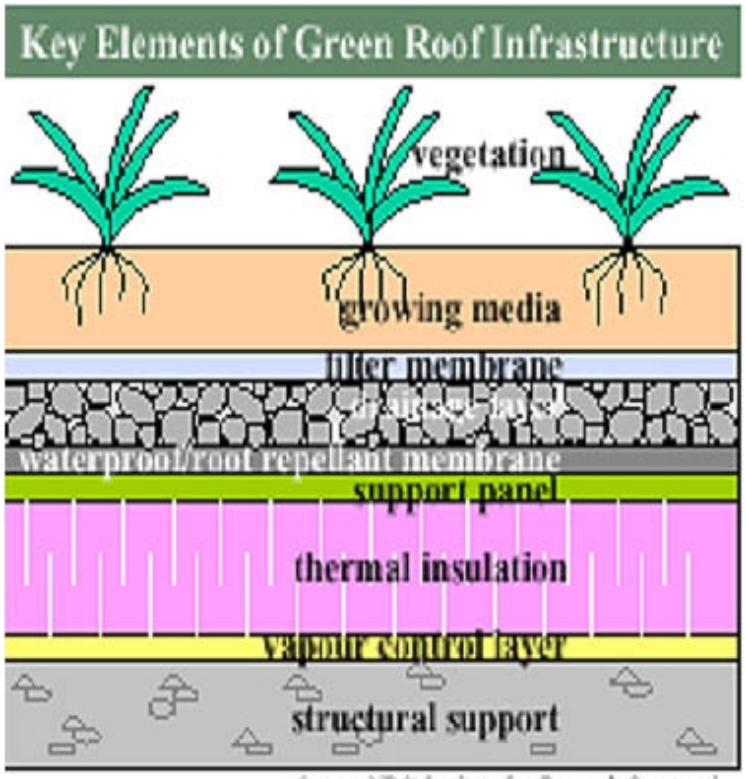
Stormwater retention system that is designed to support green space on top of a human made structure



Greenroof Technology

Green roof infrastructure differs from containerized rooftop because it is part of the roofing system.

The elements include: a special waterproof and root repellant membrane, a drainage system, a lightweight growing medium and appropriate plants.



Source: NRC, Institute for Research Construction

Canadian Greenroofs

Ryerson Polytechnic, Toronto

Vancouver Public Library

Final Proposals: Preet Heer and Erin Embley

Solar Aquatics

Greenhouse-based water treatment system

System that treats wastewater using natural bio/geo/chemical processes common to streams, rivers and marshes

Greywater Recycling

"Phosphate rich soaps and mild cleaning chemicals (greywater) are considered pollutants because they accelerate algae growth in the waterways, which in turn leads to oxygen depletion for fish and other marine lifeforms. The beauty of this "problem" is that these same phosphorous, nitrogen, potassium and protein "pollutants" are excellent sources of nutrition when you reuse greywater for irrigation of fruit trees, landscaping, and gardens (planter beds)."

The Natural Home Building Source
www.thenaturalhome.com/greywater.html

Local Greywater Recycling

CK Choi Building, UBC

- Utilizes subsurface constructed wetland to filter and clean water naturally with the help of plants and microbial life.
- Site also includes a 7000 gallon cistern to collect rainwater to irrigate the landscape during the summer.
- Water conservation achieved through low water use fixtures and composting toilets throughout the building.

Geothermal Heating

Burnaby Mountain Secondary School

Costs usually recovered within 5 years, residential set ups now increasingly feasible. One incentive is possible rebates from BC Gas.

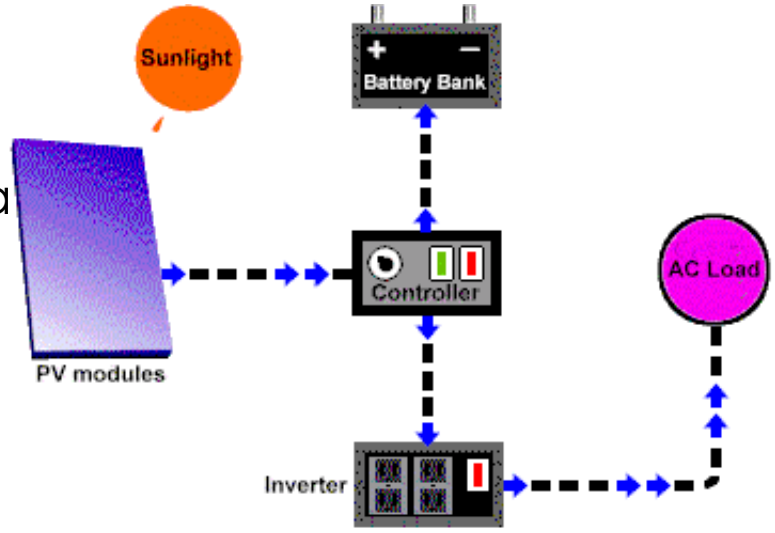
Ground source heat pump
Extracts heat from and rejects
heat to the ground through 24 km of pipe below play fields.

Photovoltaics

Converting sunlight directly into electrica energy

Essentially a solar powered battery that uses light to fuel it

**CK Choi is designed to accommodate this technology but is not yet equipped with the cells.



Oberlin College, Ohio

scenes on hastings

Mixed Use Buildings

Capers, on West 4th Avenue

First commercial use of ground source energy in Western Canada

Five-storey mixed use including ground floor retail, second floor offices, apartments on the 3rd and 4th floors

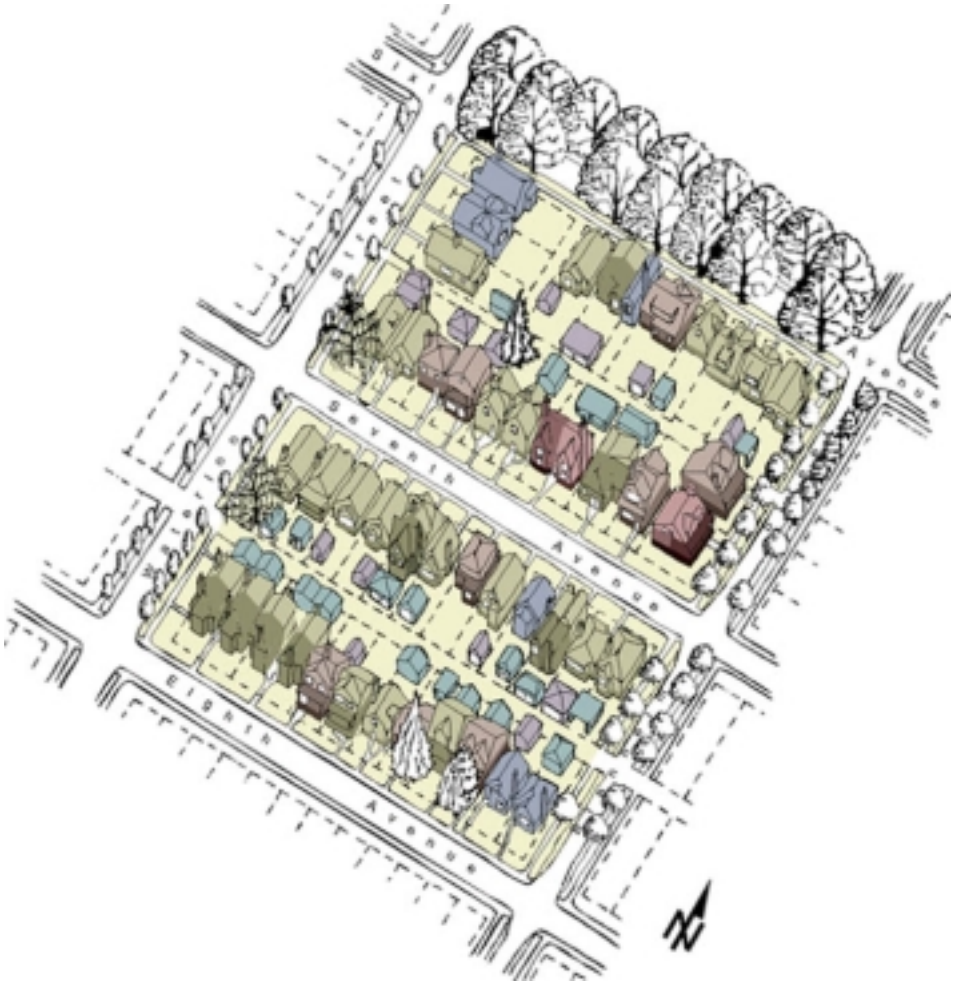
Mixed Housing Types

scenes on hastings

Ground oriented

Preserve residential character

Rental Units


Sixth Avenue
Seventh Avenue
Eighth Avenue

Secondary-Suite Options

scenes on hastings

- Mortgage helper creates mix of incomes
- This option also makes home ownership more feasible
- Recognizing secondary suites allows infill with potential little change to infrastructure

PART 4

Battling the process, working within and around existing zoning and regulatory policies

Challenges to Implementation

Region

- Lack of sustainable focus in policy making
- Funding cuts to social programs

City

- Existing Infrastructure supports traditional methods (out-dated engineering standards)
- Government liability (floods, infrastructure failure)
- No incentive for developer innovation

Neighborhood

- Alternative development not in line with social norms
- Lack of knowledge about possible alternatives
- Lack of trust in infrastructure

Personal

- High front end costs for implementation
- Perception of high maintenance
- Intuitively not aesthetically pleasing to many

scenes on hastings

Strategies Currently in Place

- CBIP Program
- GVRD shift to Sustainability
- LEEDS BC Initiative

Small Scale Recommendations

Options for Increased Environmental Sustainability

- Rainwater collection
  - ranging from basic outdoor use in gardens etc. to indoor drinking water depending on the degree of infrastructure desired

- Composting
  - simple backyard composting pile to self-contained mechanical composting systems.

- Rooftop gardens
  - utilizing unused outdoor space (decks, rooftops etc) for vegetables and other plant growth.

- Reducing water use for toilet
  - ranging from replacing standard toilet with a composting/low flow toilet to adding weight (brick, water bottle) to toilet tank.

Small Scale Recommendations

Options for increased Social Sustainability

- Encourage Housing Mixture in Neighbourhood
  - ranging from secondary suites to higher density infill development

- Participate and Encourage Use of Community Gardens
  - ranging from organizing a new gardens to increasing the use of existing plots.

- Focusing spending on local shops
  - creating stronger ties between the commercial and residential community, and secure local sources of products for the long term.

- Help to Build Capacity with the Neighbourhood
  - utilize community centres etc. as a area to exchange skills and knowledge for community improvement (language skills, facilitation skills etc.)

Policy Recommendations

•Work with LEEDS BC (or similar policy framework) to support Sustainable building practices at all levels of government

•Assess impediments to sustainable building practices and create programs such as tax incentives, density transfer and bonus systems to alleviate those impediments

•Use a full cost accounting approach in calculating infrastructure costs

•Include sustainability themes in visioning workshops

•Rezone incrementally to accommodate housing diversity to accommodate the needs of all ages and affordability

•Provide adequate special needs housing for seniors and disabled persons

Residential Building Form Recommendations

Commercial Building Form Recommendations

scenes on hastings

Proposed Zoning